WA 2917
3-30-93
8A

PROJECT MEMORANDUM

DATE: March 30, 1993

TO: Joe Depner, Hydrogeologist

FROM: Nels Cone, Chemist

SUBJECT: DATA VALIDATION OF ANALYTICAL RESULTS FROM PIER 91 RCRA FACILITY INVESTIGATION, PROJECT 624878, DATA SET #8A

On January 9, 1993, soil samples were collected by Burlington Environmental Inc. personnel. These samples were submitted to Sound Analytical Services of Tacoma, Washington for volatile organic (EPA SW-846 Method 8240), semivolatile organic (EPA SW-846 Method 8270), and Total Petroleum Hydrocarbon (EPA SW-846 Methods 418.1 and 8015) analyses (work order 29709). I performed a review of the analytical results for samples CP-122AC-2-4, CP-122AC-6-8, and CP-122AC-22-24.

Properly completed chain-of-custody forms were included, along with documented signatures from field to laboratory receipt. The samples were shown as having been properly iced and received in good condition. Holding times were clearly written and evaluated according to regulatory protocol (*National Functional Guidelines for Organic Data Review*, USEPA, 1990). The samples received the analyses as required by the Quality Assurance Project Plan (QAPP), and laboratory extraction/analysis times met the established guidelines.

Matrix spike/ matrix spike duplicate analyses displayed analytical accuracy within required guidelines. Duplicate analysis met requisite precision criteria. Method blank data met acceptable quality control (QC) limits. Sample results received the appropriate "B" data qualifier flags when lab contaminants (i.e., methylene chloride, di-n-butylphthalate, or bis(2-ethylhexyl)phthalate) were found in the method blanks.

Sample CP-122AC-2-4 was diluted to ensure target analytes were within instrument calibration range. As a result of required dilution, elevated detection limits are reported for semivolatile organic analysis, and three surrogate recoveries were outside QC limits. Regardless, the data quality objectives as defined in Table F-2 of the QAPP are met. Accordingly, this data set can be considered valid for its intended use.

NC/rlk/b46:2177b.mem

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

February 23, 1993

TO: Burlington Environmental Engineering

PROJECT NUMBER: 624878-7302

PROJECT NAME: Pier 91

LABORATORY WORK ORDER NUMBER: 29709

Samples were taken on 1/19/93 and were received at Sound on 1/21/93. Samples were analyzed for Volatile Organics in accordance with EPA SW-846 Method 8240, Semivolatile Organics in accordance with EPA SW-846 Method 8270, Total Petroleum Hydrocarbons by EPA Method 418.1 modified for soil, and Total Petroleum Fuel Hydrocarbons by EPA Method 8015 modified.

VOLATILE ORGANICS

Samples 29709-1 through 29709-3 were extracted and analyzed on 1/25/93. Methylene chloride was detected in the method blank at a level above the PQL. Sample results for methylene chloride were flagged B to indicate this. All QC parameters were within acceptance limits.

SEMIVOLATILE ORGANICS

Samples 29709-1 through 29709-3 were extracted and analyzed on 1/27/93. Sample 29709-1 was diluted due to high TPH concentration. No target analytes were detected in the method blank above the PQL. The relative percent difference value for bis(2-ethylhexyl)phthalate in the duplicate analysis exceeded QC limits, but the compound was present at concentrations below the PQL. MS/MSD percent recoveries for 1,2,4-trichlorobenzene and 1,4-dichlorobenzene were below QC limits. All other QC parameters were within acceptance limits.

TOTAL PETROLEUM FUEL HYDROCARBONS

Samples 29709-1 through 29709-3 were extracted and analyzed on 1/22/93. No contamination above the PQL was present in the method blank. Sample 29709-1 was flagged X2 to note the presence of atypical compounds that fall across multiple product ranges. The percent recovery for one surrogate in sample 29709-1 was outside QC limits due to high contaminant levels. All other QC parameters were within acceptance limits.

SOUND ANALYTICAL SERVICES, INC.

TOTAL PETROLEUM HYDROCARBONS

Samples 29709-1 through 29709-3 were extracted and analyzed on 1/26/93. No contamination above the PQL was present in the method blank. All QC parameters were within acceptance limits.

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

Report To: Burlington Environmental, Technical Services
Date: February 19, 1993

Report On: Analysis of Soil
Lab No.: 29709

IDENTIFICATION:
Sample received on 01-21-93
Project: 624878-7302 Pier 91

ANALYSIS:

Lab No. 29709-1 Client ID: CP-122AC-2-4

Volatile Organics by Method 8240
Date Extracted: 1-25-93
Date Analyzed: 1-25-93

Compound	Concentration ug/kg	PQL	Flag
Chloromethane	ND	500	
Bromomethane	ND	500	
Vinyl Chloride	ND	500	
Chloroethane	ND	500	
Methylene Chloride	450	250	B
Acetone	110	2,500	J
Carbon Disulfide	ND	250	
1,1-Dichloroethene	ND	250	
1,1-Dichloroethane	ND	250	
1,2-Dichloroethene (Total)	ND	250	
Chloroform	ND	250	
1,2-Dichloroethane	ND	250	
2-Butanone	ND	1,250	
1,1,1-Trichloroethane	ND	250	
Carbon Tetrachloride	ND	250	
Vinyl Acetate	ND	1,250	
Bromodichloromethane	ND	250	
1,2-Dichloropropane	ND	250	
Cis-1,3-Dichloropropene	ND	250	
Trichloroethene	ND	250	
Dibromochloromethane	ND	250	
1,1,2-Trichloroethane	ND	250	

ND = Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-1 Client ID: CP-122AC-2-4

8240 Continued . . .

Compound	Concentration ug/kg	PQL	Flag
Benzene	ND	250	
Trans-1,3-Dichloropropene	ND	250	
Bromoform	ND	250	
4-Methyl-2-Pentanone	ND	1,250	
2-Hexanone	ND	250	
Tetrachloroethene	ND	250	
1,1,2,2-Tetrachloroethane	ND	250	
Toluene	ND	250	
Chlorobenzene	ND	250	
Ethyl Benzene	ND	250	
Styrene	ND	250	
Total Xylenes	ND	250	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	100	88 - 110	81 - 117
Bromofluorobenzene	104	86 - 115	74 - 121
1,2-Dichloroethane-D4	93	76 - 114	70 - 121

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-1 Client ID: CP-122AC-2-4

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 1-27-93
Date Analyzed: 2-5-93

Compound	Concentration ug/kg	PQL	Flag
Phenol	ND	3,900	
bis(2-Chloroethyl) ether	ND	3,900	
2-Chlorophenol	ND	3,900	
1,3-Dichlorobenzene	ND	3,900	
1,4-Dichlorobenzene	ND	3,900	
Benzyl Alcohol	ND	7,800	
1,2-Dichlorobenzene	ND	3,900	
2-Methylphenol	ND	3,900	
bis(2-Chloroisopropyl)ether	ND	3,900	
4-Methylphenol	ND	3,900	
N-Nitroso-Di-N-propylamine	ND	3,900	
Hexachloroethane	ND	3,900	
Nitrobenzene	ND	3,900	
Isophorone	ND	3,900	
2-Nitrophenol	ND	3,900	
2,4-Dimethylphenol	ND	3,900	
Benzoic Acid	ND	19,000	
bis(2-Chloroethoxy)methane	ND	3,900	
2,4-Dichlorophenol	ND	3,900	
1,2,4-Trichlorobenzene	ND	3,900	
Naphthalene	ND	3,900	
4-Chloroaniline	ND	7,800	
Hexachlorobutadiene	ND	3,900	
4-Chloro-3-methylphenol	ND	7,800	

ND - Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-1 Client ID: CP-122AC-2-4

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
2-Methylnaphthalene	ND	3,900	
Hexachlorocyclopentadiene	ND	3,900	
2,4,6-Trichlorophenol	ND	3,900	
2,4,5-Trichlorophenol	ND	3,900	
2-Chloronaphthalene	ND	3,900	
2-Nitroaniline	ND	19,000	
Dimethyl phthalate	ND	3,900	
Acenaphthylene	ND	3,900	
2,6-Dinitrotoluene	ND	3,900	
3-Nitroaniline	ND	19,000	
Acenaphthene	ND	3,900	
2,4-Dinitrophenol	ND	19,000	
4-Nitrophenol	ND	19,000	
Dibenzofuran	ND	3,900	
2,4-Dinitrotoluene	ND	3,900	
Diethylphthalate	ND	3,900	
4-Chlorophenyl phenyl ether	ND	3,900	
Fluorene	ND	3,900	
4-Nitroaniline	ND	19,000	
4,6-Dinitro-2-methylphenol	ND	19,000	
N-Nitrosodiphenylamine	ND	3,900	
4-Bromophenyl phenyl ether	ND	3,900	
Hexachlorobenzene	ND	3,900	
Pentachlorophenol	ND	19,000	
Phenanthrene	ND	3,900	
Anthracene	ND	3,900	
Di-n-butylphthalate	ND	3,900	

ND - Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-1 Client ID: CP-122AC-2-4

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
Fluoranthene	ND	3,900	
Pyrene	ND	3,900	
Butyl benzyl phthalate	ND	3,900	
3,3'-Dichlorobenzidine	ND	7,800	
Benzo(a)anthracene	ND	3,900	
Chrysene	ND	3,900	
bis(2-ethylhexyl)phthalate	ND	3,900	
Di-n-octyl phthalate	ND	3,900	
Benzo(b)fluoranthene	ND	3,900	
Benzo(k)fluoranthene	ND	3,900	
Benzo(a)pyrene	ND	3,900	
Indeno(1,2,3-cd)pyrene	ND	3,900	
Dibenz(a,h)anthracene	ND	3,900	
Benzo(g,h,i)perylene	ND	3,900	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	67	35 - 114	23 - 120
2-Fluorobiphenyl	100	43 - 116	30 - 115
p-Terphenyl-d_{14}	84	33 - 141	18 - 137
Phenol-d_6	73	10 - 94	24 - 113
2-Fluorophenol	71	21 - 100	25 - 121
2,4,6-Tribromophenol	67	10 - 123	19 - 122

Continued. . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-1 Client ID: CP-122AC-2-4

TPH Per EPA Method 418.1
Date Extracted: 1-26-93
Date Analyzed: 1-26-93

Total Petroleum Hydrocarbons, mg/kg	900	

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 1-26-93
Date Analyzed: 1-26-93

Total Petroleum Fuel Hydrocarbons, mg/kg	2,600	X2
TPH as	Aged Gasoline, Diesel	

SURROGATE RECOVERY, %		
1-chlorooctane	120	
o-terphenyl	176	X10

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-2 Client ID: CP-122AC-6-8

Volatile Organics by Method 8240
Date Extracted: 1-25-93
Date Analyzed: 1-25-93

Compound	Concentration ug/kg	PQL	Flag
Chloromethane	ND	500	
Bromomethane	ND	500	
Vinyl Chloride	ND	500	
Chloroethane	ND	500	
Methylene Chloride	300	250	B
Acetone	330	2,500	J
Carbon Disulfide	ND	250	
1,1-Dichloroethene	ND	250	
1,1-Dichloroethane	ND	250	
1,2-Dichloroethene (Total)	ND	250	
Chloroform	ND	250	
1,2-Dichloroethane	ND	250	
2-Butanone	ND	1,250	
1,1,1-Trichloroethane	ND	250	
Carbon Tetrachloride	ND	250	
Vinyl Acetate	ND	1,250	
Bromodichloromethane	ND	250	
1,2-Dichloropropane	ND	250	
Cis-1,3-Dichloropropene	ND	250	
Trichloroethene	ND	250	
Dibromochloromethane	ND	250	
1,1,2-Trichloroethane	ND	250	

ND = Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-2 Client ID: CP-122AC-6-8

8240 Continued . . .

Compound	Concentration ug/kg	PQL	Flag
Benzene	ND	250	
Trans-1,3-Dichloropropene	ND	250	
Bromoform	ND	250	
4-Methyl-2-Pentanone	ND	1,250	
2-Hexanone	ND	250	
Tetrachloroethene	ND	250	
1,1,2,2-Tetrachloroethane	ND	250	
Toluene	ND	250	
Chlorobenzene	ND	250	
Ethyl Benzene	ND	250	
Styrene	ND	250	
Total Xylenes	ND	250	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	103	88 - 110	81 - 117
Bromofluorobenzene	95	86 - 115	74 - 121
1,2-Dichloroethane-D4	94	76 - 114	70 - 121

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-2 Client ID: CP-122AC-6-8

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 1-27-93
Date Analyzed: 2-5-93

Compound	Concentration ug/kg	PQL	Flag
Phenol	ND	790	
bis(2-Chloroethyl) ether	ND	790	
2-Chlorophenol	ND	790	
1,3-Dichlorobenzene	ND	790	
1,4-Dichlorobenzene	ND	790	
Benzyl Alcohol	ND	1,600	
1,2-Dichlorobenzene	ND	790	
2-Methylphenol	ND	790	
bis(2-Chloroisopropyl)ether	ND	790	
4-Methylphenol	ND	790	
N-Nitroso-Di-N-propylamine	ND	790	
Hexachloroethane	ND	790	
Nitrobenzene	ND	790	
Isophorone	ND	790	
2-Nitrophenol	ND	790	
2,4-Dimethylphenol	ND	790	
Benzoic Acid	ND	4,000	
bis(2-Chloroethoxy)methane	ND	790	
2,4-Dichlorophenol	ND	790	
1,2,4-Trichlorobenzene	ND	790	
Naphthalene	ND	790	
4-Chloroaniline	ND	1,600	
Hexachlorobutadiene	ND	790	
4-Chloro-3-methylphenol	ND	1,600	

ND - Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-2 Client ID: CP-122AC-6-8

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
2-Methylnaphthalene	ND	790	
Hexachlorocyclopentadiene	ND	790	
2,4,6-Trichlorophenol	ND	790	
2,4,5-Trichlorophenol	ND	790	
2-Chloronaphthalene	ND	790	
2-Nitroaniline	ND	4,000	
Dimethyl phthalate	ND	790	
Acenaphthylene	ND	790	
2,6-Dinitrotoluene	ND	790	
3-Nitroaniline	ND	4,000	
Acenaphthene	ND	790	
2,4-Dinitrophenol	ND	4,000	
4-Nitrophenol	ND	4,000	
Dibenzofuran	ND	790	
2,4-Dinitrotoluene	ND	790	
Diethylphthalate	ND	790	
4-Chlorophenyl phenyl ether	ND	790	
Fluorene	ND	790	
4-Nitroaniline	ND	4,000	
4,6-Dinitro-2-methylphenol	ND	4,000	
N-Nitrosodiphenylamine	ND	790	
4-Bromophenyl phenyl ether	ND	790	
Hexachlorobenzene	ND	790	
Pentachlorophenol	ND	4,000	
Phenanthrene	ND	790	
Anthracene	ND	790	
Di-n-butylphthalate	ND	790	

ND - Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-2 Client ID: CP-122AC-6-8

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
Fluoranthene	ND	790	
Pyrene	ND	790	
Butyl benzyl phthalate	ND	790	
3,3'-Dichlorobenzidine	ND	1,600	
Benzo(a)anthracene	ND	790	
Chrysene	ND	790	
bis(2-ethylhexyl)phthalate	200	790	B,J
Di-n-octyl phthalate	ND	790	
Benzo(b)fluoranthene	ND	790	
Benzo(k)fluoranthene	ND	790	
Benzo(a)pyrene	ND	790	
Indeno(1,2,3-cd)pyrene	ND	790	
Dibenz(a,h)anthracene	ND	790	
Benzo(g,h,i)perylene	ND	790	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	41	35 - 114	23 - 120
2-Fluorobiphenyl	82	43 - 116	30 - 115
p-Terphenyl-d_{14}	88	33 - 141	18 - 137
Phenol-d_6	70	10 - 94	24 - 113
2-Fluorophenol	48	21 - 100	25 - 121
2,4,6-Tribromophenol	59	10 - 123	19 - 122

Continued. . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-2 Client ID: CP-122AC-6-8

TPH Per EPA Method 418.1
Date Extracted: 1-26-93
Date Analyzed: 1-26-93

Total Petroleum Hydrocarbons, mg/kg	630

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 1-26-93
Date Analyzed: 1-26-93

Total Petroleum Fuel Hydrocarbons, mg/kg	570
TPH as	Aged Gasoline, Diesel

SURROGATE RECOVERY, %	
1-chlorooctane	124
o-terphenyl	126

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-3 Client ID: CP-122AC-22-24

Volatile Organics by Method 8240
Date Extracted: 1-25-93
Date Analyzed: 1-25-93

Compound	Concentration ug/kg	PQL	Flag
Chloromethane	ND	500	
Bromomethane	ND	500	
Vinyl Chloride	ND	500	
Chloroethane	ND	500	
Methylene Chloride	380	250	B
Acetone	300	2,500	J
Carbon Disulfide	ND	250	
1,1-Dichloroethene	ND	250	
1,1-Dichloroethane	ND	250	
1,2-Dichloroethene (Total)	ND	250	
Chloroform	ND	250	
1,2-Dichloroethane	ND	250	
2-Butanone	ND	1,250	
1,1,1-Trichloroethane	ND	250	
Carbon Tetrachloride	ND	250	
Vinyl Acetate	ND	1,250	
Bromodichloromethane	ND	250	
1,2-Dichloropropane	ND	250	
Cis-1,3-Dichloropropene	ND	250	
Trichloroethene	ND	250	
Dibromochloromethane	ND	250	
1,1,2-Trichloroethane	ND	250	

ND = Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-3 Client ID: CP-122AC-22-24

8240 Continued . . .

Compound	Concentration ug/kg	PQL	Flag
Benzene	ND	250	
Trans-1,3-Dichloropropene	ND	250	
Bromoform	ND	250	
4-Methyl-2-Pentanone	ND	1,250	
2-Hexanone	ND	250	
Tetrachloroethene	ND	250	
1,1,2,2-Tetrachloroethane	ND	250	
Toluene	ND	250	
Chlorobenzene	ND	250	
Ethyl Benzene	ND	250	
Styrene	ND	250	
Total Xylenes	ND	250	

ND - Not Detected

PQL - Practical Quantitation Limit

Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Toluene - D8	104	88 - 110	81 - 117
Bromofluorobenzene	83	86 - 115	74 - 121
1,2-Dichloroethane-D4	92	76 - 114	70 - 121

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-3 Client ID: CP-122AC-22-24

Semivolatile Organics Per EPA SW-846 Method 8270
Date Extracted: 1-27-93
Date Analyzed: 2-4-93

Compound	Concentration ug/kg	PQL	Flag
Phenol	ND	810	
bis(2-Chloroethyl) ether	ND	810	
2-Chlorophenol	ND	810	
1,3-Dichlorobenzene	ND	810	
1,4-Dichlorobenzene	ND	810	
Benzyl Alcohol	ND	1,600	
1,2-Dichlorobenzene	ND	810	
2-Methylphenol	ND	810	
bis(2-Chloroisopropyl)ether	ND	810	
4-Methylphenol	ND	810	
N-Nitroso-Di-N-propylamine	ND	810	
Hexachloroethane	ND	810	
Nitrobenzene	ND	810	
Isophorone	ND	810	
2-Nitrophenol	ND	810	
2,4-Dimethylphenol	ND	810	
Benzoic Acid	ND	4,100	
bis(2-Chloroethoxy)methane	ND	810	
2,4-Dichlorophenol	ND	810	
1,2,4-Trichlorobenzene	ND	810	
Naphthalene	ND	810	
4-Chloroaniline	ND	1,600	
Hexachlorobutadiene	ND	810	
4-Chloro-3-methylphenol	ND	1,600	

ND - Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-3 Client ID: CP-122AC-22-24

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
2-Methylnaphthalene	ND	810	
Hexachlorocyclopentadiene	ND	810	
2,4,6-Trichlorophenol	ND	810	
2,4,5-Trichlorophenol	ND	810	
2-Chloronaphthalene	ND	810	
2-Nitroaniline	ND	4,100	
Dimethyl phthalate	ND	810	
Acenaphthylene	ND	810	
2,6-Dinitrotoluene	ND	810	
3-Nitroaniline	ND	4,100	
Acenaphthene	ND	810	
2,4-Dinitrophenol	ND	4,100	
4-Nitrophenol	ND	4,100	
Dibenzofuran	ND	810	
2,4-Dinitrotoluene	ND	810	
Diethylphthalate	ND	810	
4-Chlorophenyl phenyl ether	ND	810	
Fluorene	ND	810	
4-Nitroaniline	ND	4,100	
4,6-Dinitro-2-methylphenol	ND	4,100	
N-Nitrosodiphenylamine	ND	810	
4-Bromophenyl phenyl ether	ND	810	
Hexachlorobenzene	ND	810	
Pentachlorophenol	ND	4,100	
Phenanthrene	140	810	J
Anthracene	ND	810	
Di-n-butylphthalate	280	810	B,J

ND - Not Detected

Continued . . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-3 Client ID: CP-122AC-22-24

EPA Method 8270 Continued

Compound	Concentration ug/kg	PQL	Flag
Fluoranthene	ND	810	
Pyrene	ND	810	
Butyl benzyl phthalate	ND	810	
3,3'-Dichlorobenzidine	ND	1,600	
Benzo(a)anthracene	ND	810	
Chrysene	ND	810	
bis(2-ethylhexyl)phthalate	150	810	B,J
Di-n-octyl phthalate	ND	810	
Benzo(b)fluoranthene	ND	810	
Benzo(k)fluoranthene	ND	810	
Benzo(a)pyrene	ND	810	
Indeno(1,2,3-cd)pyrene	ND	810	
Dibenz(a,h)anthracene	ND	810	
Benzo(g,h,i)perylene	ND	810	

ND - Not Detected

PQL - Practical Quantitation Limit

Semi-Volatile Surrogates

Surrogate Compound	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d_5	49	35 - 114	23 - 120
2-Fluorobiphenyl	69	43 - 116	30 - 115
p-Terphenyl-d_{14}	89	33 - 141	18 - 137
Phenol-d_6	82	10 - 94	24 - 113
2-Fluorophenol	67	21 - 100	25 - 121
2,4,6-Tribromophenol	86	10 - 123	19 - 122

Continued. . . .

SOUND ANALYTICAL SERVICES, INC.

Burlington Environmental, Technical Services
Project: 624878-7302 Pier 91

Lab No. 29709
February 19, 1993

Lab No. 29709-3 Client ID: CP-122AC-22-24

TPH Per EPA Method 418.1
Date Extracted: 1-26-93
Date Analyzed: 1-26-93

Total Petroleum Hydrocarbons, mg/kg	22

TPH Per EPA SW-846 Modified Method 8015
Date Extracted: 1-26-93
Date Analyzed: 1-26-93

Total Petroleum Fuel Hydrocarbons, mg/kg	15
TPH as	Aged Gasoline, Diesel

SURROGATE RECOVERY, %	
1-chlorooctane	114
o-terphenyl	129

SOUND ANALYTICAL SERVICES

Dennis L. Bean

DENNIS L. BEAN

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 29709qc1
Units: ug/kg
Date: February 19, 1993
Blank No: V8082

METHOD BLANK

Compound	Blank Value	PQL	FLAGS
Chloromethane	ND	400	
Bromomethane	ND	400	
Vinyl Chloride	ND	400	
Chloroethane	ND	400	
Methylene Chloride	260	200	
Acetone	ND	2,000	
Carbon Disulfide	ND	200	
1,1-Dichloroethene	ND	200	
1,1-Dichloroethane	ND	200	
1,2-Dichloroethene (Total)	ND	200	
Chloroform	ND	200	
1,2-Dichloroethane	ND	200	
2-Butanone	ND	1,000	
1,1,1-Trichloroethane	ND	200	
Carbon Tetrachloride	ND	200	
Vinyl Acetate	ND	1,000	
Bromodichloromethane	ND	200	
1,2-Dichloropropane	ND	200	
Cis-1,3-Dichloropropene	ND	200	
Trichloroethene	ND	200	
Dibromochloromethane	ND	200	
1,1,2-Trichloroethane	ND	200	
Benzene	ND	200	
Trans-1,3-Dichloropropene	ND	200	
Bromoform	ND	200	
4-Methyl-2-Pentanone	ND	1,000	
2-Hexanone	ND	200	
Tetrachloroethene	ND	200	
1,1,2,2-Tetrachloroethane	ND	200	
Toluene	ND	200	
Chlorobenzene	ND	200	
Ethyl Benzene	ND	200	
Styrene	ND	200	
Total Xylenes	ND	200	

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

VOLATILE ORGANICS PER EPA METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 29709qc1
Units: ug/kg
Date: February 19, 1993
Blank No: V8082

METHOD BLANK

ND - Not Detected

PQL - Practical Quantitation Limit

VOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Soil
Toluene - d8	105	86 - 115	81 - 117
Bromofluorobenzene	103	76 - 114	74 - 121
1,2-Dichloroethane d4	94	88 - 110	70 - 121

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

VOLATILE ORGANICS - METHOD 8240

Client: Burlington Environmental, Technical Services
Lab No: 29709qc2
Units: ug/kg
Date: February 19, 1993

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

MSD No. 29709-3

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Spike Dup Result (MSD)	Spike Added (SA)	%R	RPD
1,1-DCE	ND	3,500	2,400	146	3,500	2,400	146	0.0
TCE	ND	1,800	2,400	75.0	1,800	2,400	75.0	0.0
Chloro-benzene	ND	2,000	2,400	83.3	1,900	2,400	79.1	5.1
Toluene	ND	1,900	2,400	79.1	1,900	2,400	79.1	0.0
Benzene	ND	1,700	2,400	70.8	1,700	2,400	70.8	0.0

RPD = Relative Percent Difference
= [(MS - MSD) / ((MS + MSD) / 2)] x 100

% REC = Percent Recovery
= [(MS - SAMPLE RESULT) / SPIKE] x 100

Advisory Limits:

	RPD	% RECOVERY
1,1-Dichloroethene	22	59 - 172
Trichloroethene	24	62 - 137
Chlorobenzene	21	60 - 133
Toluene	21	59 - 139
Benzene	21	66 - 142

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons
by Method 8015

Client: Burlington Environmental, Technical Services
Lab No: 29709qc3
Matrix: Soil
Units: mg/kg
Date: February 19, 1993

DUPLICATE

Dup. No. 29709-3

Parameter	Sample(S)	Duplicate(D)	RPD
Total Petroleum Fuel Hydrocarbons	15	13	17.1
SURROGATE RECOVERY%			
1-chlorooctane	114	107	
o-terphenyl	129	119	

RPD = relative percent difference
= [(S - D) / ((S + D) / 2)] x 100

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

MSD No. 29709-3

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Flag
Total Petroleum Fuel Hydrocarbons	30	527	405	123	

%R = Percent Recovery
= [(MS - SR) / SA] x 100

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

Total Petroleum Fuel Hydrocarbons
by Method 8015

Client: Burlington Environmental, Technical Services
Lab No: 29709qc3
Matrix: Soil
Units: mg/kg
Date: February 19, 1993

BLANK SPIKE RECOVERY

BS No. 004F0101.D

Parameter	Spike Added	Spike Recovered	%R
Diesel	405	487	120

%R = Percent Recovery
= [(MS - SR) / SA] x 100

METHOD BLANK

Blank No. 003F0101.D

Parameter	Blank Value
Total Petroleum Fuel Hydrocarbons	< 10
SURROGATE RECOVERY%	
1-chlorooctane	104
o-terphenyl	103

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

QUALITY CONTROL REPORT

TPH by Method 418.1

Client: Burlington Environmental, Technical Services
Lab No: 29709qc4
Matrix: Soil
Units: mg/kg
Date: February 19, 1993

DUPLICATE

Dup No. 29709-3

Parameter	Sample(S)	Duplicate(D)	RPD	Flag
Total Petroleum Hydrocarbons	22	22	0.0	

RPD = Relative Percent Difference
= [(S - D) / ((S + D) / 2)] x 100

MATRIX SPIKE RECOVERY

MSD No. 29709-3

Parameter	Sample Result (SR)	Spiked Sample Result (MS)	Spike Added (SA)	%R	Flag
Total Petroleum Hydrocarbons	22	1,100	1,120	96.3	

%R = Percent Recovery
= [(MS - SR) / SA] x 100

RPD = Relative Percent Difference
= [(MS - MSD) / ((MS + MSD) / 2)] x 100

METHOD BLANK

Parameter	Blank Value
Total Petroleum Hydrocarbons	< 10

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 29709qc5
Units: ug/kg
Date: February 19, 1993
Blank No: SBLK25-S7542

METHOD BLANK

Compound	Blank Value	PQL	Flags
Phenol	ND	670	
bis(2-Chloroethyl) ether	ND	670	
2-Chlorophenols	ND	670	
1,3-Dichlorobenzene	ND	670	
1,4-Dichlorobenzene	ND	670	
Benzyl Alcohol	ND	1,300	
1,2-Dichlorobenzene	ND	670	
2-Methylphenol	ND	670	
bis(2-Chloroisopropyl)ether	ND	670	
4-Methylphenol	ND	670	
N-Nitroso-Di-N-propylamine	ND	670	
Hexachloroethane	ND	670	
Nitrobenzene	ND	670	
Isophorone	ND	670	
2-Nitrophenol	ND	670	
2,4-Dimethylphenol	ND	670	
Benzoic Acid	ND	3,300	
bis(2-Chloroethoxy)methane	ND	670	
2,4-Dichlorophenol	ND	670	
1,2,4-Trichlorobenzene	ND	670	
Naphthalene	ND	670	
4-Chloroaniline	ND	1,300	
Hexachlorobutadiene	ND	670	
4-Chloro-3-methylphenol	ND	1,300	
2-Methylnaphthalene	ND	670	
Hexachlorocyclopentadiene	ND	670	
2,4,6-Trichlorophenol	ND	670	
2,4,5-Trichlorophenol	ND	670	
2-Chloronaphthalene	ND	670	
2-Nitroaniline	ND	3,300	
Dimethyl phthalate	ND	670	
Acenaphthylene	ND	670	

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 29709qc5
Units: ug/kg
Date: February 19, 1993
Blank No: SBLK25-S7542

METHOD BLANK

Compound	Blank Value	PQL	Flags
3-Nitroaniline	ND	3,300	
Acenaphthene	ND	670	
2,4-Dinitrophenol	ND	3,300	
4-Nitrophenol	ND	3,300	
Dibenzofuran	ND	670	
2,4-Dinitrotoluene	ND	670	
2,6-Dinitrotoluene	ND	670	
Diethylphthalate	ND	670	
4-Chlorophenyl phenyl ether	ND	670	
Fluorene	ND	670	
4-Nitroaniline	ND	3,300	
4,6-Dinitro-2-methylphenol	ND	3,300	
N-Nitrosodiphenylamine	ND	670	
4-Bromophenyl phenyl ether	ND	670	
Hexachlorobenzene	ND	670	
Pentachlorophenol	ND	3,300	
Phenanthrene	ND	670	
Anthracene	ND	670	
Di-n-butylphthalate	120	670	J
Fluoranthene	ND	670	
Pyrene	ND	670	
Butyl benzyl phthalate	ND	670	
3,3'-Dichlorobenzidine	ND	1,300	
Benzo(a)anthracene	ND	670	
bis(2-ethylhexyl)phthalate	260	670	J
Chrysene	ND	670	
Di-n-octyl phthalate	ND	670	
Benzo(b)fluoranthene	ND	670	
Benzo(k)fluoranthene	ND	670	
Benzo(a)pyrene	ND	670	
Indeno(1,2,3-cd)pyrene	ND	670	
Dibenz(a,h)anthracene	ND	670	
Benzo(g,h,i)perylene	ND	670	

Continued. . . .

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 29709qc5
Units: ug/kg
Date: February 19, 1993
Blank No: SBLK25-S7542

ND - Not Detected.

PQL - Practical Quantitation Limit

SEMIVOLATILE SURROGATES

Surrogate	Percent Recovery	Control Limits Water	Soil
Nitrobenzene - d5	90	35 - 114	23 - 120
2-Fluorobiphenyl	87	43 - 116	30 - 115
p-Terphenyl-d14	86	33 - 141	18 - 137
Phenol-d6	89	10 - 94	24 - 113
2-Fluorophenol	91	21 - 100	25 - 121
2,4,6-TBP	75	10 - 123	19 - 122

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

MATRIX SPIKE / MATRIX SPIKE DUPLICATE RECOVERY

Client Name: Burlington Environmental, Technical Services
Lab No: 29709qc6
Date: February 19, 1993

SEMI-VOLATILE ORGANICS

MSD No. 29709-3

COMPOUND	SPIKE (ug/kg)	SAMPLE RESULT	CONC MS	% REC	CONC MSD	% REC	RPD	FLAGS
1,2,4-Trichlorobenzene	4,100	ND	1,300	32	1,300	33	3.1	X6
Acenaphthene	4,100	ND	2,700	65	2,700	65	0.0	
2,4 Dinitrotoluene	4,100	ND	2,900	71	2,900	71	0.0	
Pyrene	4,100	ND	3,000	73	3,200	77	5.3	
N-nitrosodi-n-Propylamine	4,100	ND	2,800	68	2,900	70	2.9	
1,4-Dichlorobenzene	4,100	ND	500	12	540	13	8.0	X6
Pentachlorophenol	4,100	ND	1,800	43	2,000	49	13.0	
Phenol	4,100	ND	2,900	70	2,800	69	1.4	
2-Chlorophenol	4,100	ND	2,500	60	2,400	58	3.4	
4-Chloro-3-Methylphenol	4,100	ND	3,200	77	3,100	76	1.3	
4-Nitrophenol	4,100	ND	3,400	82	3,200	77	6.3	

RPD = Relative Percent Difference
% REC = Percent Recovery

ADVISORY LIMITS:	RPD	% RECOVERY
1,2,4-Trichlorobenzene	23	38 - 107
Acenaphthene	19	31 - 137
2,4 Dinitrotoluene	47	28 - 89
Pyrene	36	35 - 142
N-nitrosodi-n-Propylamine	38	41 - 126
1,4-Dichlorobenzene	27	28 - 104
Pentachlorophenol	47	17 - 109
Phenol	35	26 - 90
2-Chlorophenol	50	25 - 102
4-Chloro-3-Methylphenol	33	26 - 103
4-Nitrophenol	50	11 - 114

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206)922-2310 - FAX (206)922-5047

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA SW-846 METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 29709qc7
Matrix: Soil
Units: mg/kg
Date: February 23, 1993
Dup No: 29709-3

	DUPLICATE			
Compound	Sample (S)	Duplicate (D)	RPD	FLAGS
Phenol	ND	ND	0.0	
bis(2-Chloroethyl) ether	ND	ND	0.0	
2-Chlorophenol	ND	ND	0.0	
1,3-Dichlorobenzene	ND	ND	0.0	
1,4-Dichlorobenzene	ND	ND	0.0	
Benzyl Alcohol	ND	ND	0.0	
1,2-Dichlorobenzene	ND	ND	0.0	
2-Methylphenol	ND	ND	0.0	
bis(2-Chloroisopropyl)ether	ND	ND	0.0	
4-Methylphenol	ND	ND	0.0	
N-Nitroso-Di-N-propylamine	ND	ND	0.0	
Hexachloroethane	ND	ND	0.0	
Nitrobenzene	ND	ND	0.0	
Isophorone	ND	ND	0.0	
2-Nitrophenol	ND	ND	0.0	
2,4-Dimethylphenol	ND	ND	0.0	
Benzoic Acid	ND	ND	0.0	
bis(2-Chloroethoxy)methane	ND	ND	0.0	
2,4-Dichlorophenol	ND	ND	0.0	
1,2,4-Trichlorobenzene	ND	ND	0.0	
Naphthalene	ND	ND	0.0	
4-Chloroaniline	ND	ND	0.0	
Hexachlorobutadiene	ND	ND	0.0	
4-Chloro-3-methylphenol	ND	ND	0.0	
2-Methylnaphthalene	ND	ND	0.0	
Hexachlorocyclopentadiene	ND	ND	0.0	
2,4,6-Trichlorophenol	ND	ND	0.0	
2,4,5-Trichlorophenol	ND	ND	0.0	
2-Chloronaphthalene	ND	ND	0.0	
2-Nitroaniline	ND	ND	0.0	
Dimethyl phthalate	ND	ND	0.0	

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA SW-846 METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 29709qc7
Matrix: Soil
Units: ug/kg
Date: February 23, 1993
Dup No: 29709-3

	DUPLICATE			
Compound	Sample (S)	Duplicate (D)	RPD	FLAGS
Acenaphthylene	ND	ND	0.0	
3-Nitroaniline	ND	ND	0.0	
Acenaphthene	ND	ND	0.0	
2,4-Dinitrophenol	ND	ND	0.0	
4-Nitrophenol	ND	ND	0.0	
Dibenzofuran	ND	ND	0.0	
2,4-Dinitrotoluene	ND	ND	0.0	
2,6-Dinitrotoluene	ND	ND	0.0	
Diethylphthalate	ND	ND	0.0	
4-Chlorophenyl phenyl ether	ND	ND	0.0	
Fluorene	ND	ND	0.0	
4-Nitroaniline	ND	ND	0.0	
4,6-Dinitro-2-methylphenol	ND	ND	0.0	
N-Nitrosodiphenylamine	ND	ND	0.0	
4-Bromophenyl phenyl ether	ND	ND	0.0	
Hexachlorobenzene	ND	ND	0.0	
Pentachlorophenol	ND	ND	0.0	
Phenanthrene	140	150	6.9	J
Anthracene	ND	ND	0.0	
Di-n-butylphthalate	280	320	13	J/B
Fluoranthene	ND	ND	0.0	
Pyrene	ND	ND	0.0	
Butyl benzyl phthalate	ND	ND	0.0	
3,3'-Dichlorobenzidine	ND	ND	0.0	
Benzo(a)anthracene	ND	ND	0.0	
bis(2-ethylhexyl)phthalate	150	110	33	X4a/J/B
Chrysene	ND	ND	0.0	
Di-n-octyl phthalate	ND	ND	0.0	
Benzo(b)fluoranthene	ND	ND	0.0	
Benzo(k)fluoranthene	ND	ND	0.0	
Benzo(a)pyrene	ND	ND	0.0	
Indeno(1,2,3-cd)pyrene	ND	ND	0.0	
Dibenz(a,h)anthracene	ND	ND	0.0	
Benzo(g,h,i)perylene	ND	ND	0.0	

Continued . . . . .

SOUND ANALYTICAL SERVICES, INC.

QUALITY CONTROL REPORT

SEMIVOLATILE ORGANICS PER EPA SW-846 METHOD 8270

Client: Burlington Environmental, Technical Services
Lab No: 29709qc7
Matrix: Soil
Units: ug/kg
Date: February 23, 1993
Dup No: 29709-3

DUPLICATE

ND = Not Detected

RPD = Relative Percent Difference
= [(S - D) / ((S + D) / 2)] x 100

SEMIVOLATILE SURROGATES

Surrogate	Sample	Duplicate	Control Limits Water	Control Limits Soil
Nitrobenzene - d5	49	67	35 - 114	23 - 120
2-Fluorobiphenyl	69	78	43 - 116	30 - 115
p-Terphenyl-d14	89	96	33 - 141	18 - 137
Phenol-d6	82	87	10 - 94	24 - 113
2-Fluorophenol	67	82	21 - 100	25 - 121
2,4,6-TBP	86	85	10 - 123	19 - 122

SOUND ANALYTICAL SERVICES, INC.

SPECIALIZING IN INDUSTRIAL & TOXIC WASTE ANALYSIS

4813 PACIFIC HIGHWAY EAST, TACOMA, WASHINGTON 98424 - TELEPHONE (206) 922-2310 - FAX (206) 922-5047

DATA QUALIFIER FLAGS

ND: Indicates that the analyte was analyzed for but was not detected. The associated numerical value is the practical quantitation limit, corrected for sample dilution.

J: The analyte was analyzed for and positively identified, but the associated numerical value is an estimated quantity.

C: The identification of this analyte was confirmed by GC/MS.

B1: This analyte was also detected in the associated method blank. The reported sample results have been adjusted for moisture, final exract volume, and/or dilutions performed during extract preparation. The analyte concentration was evaluated prior to sample preparation adjustments, and was determined not to be significantly higher than the associated method blank (less than ten times the concentration reported in the blank).

B2: This analyte was also detected in the associated method blank. However, the analyte concentration in the sample was determined to be significantly higher than the method blank (greater than ten times the concentration reported in the blank).

E: The concentration of this analyte exceeded the instrument calibration range.

D: The reported result for this analyte is calculated based on a secondary dilution factor.

A: This TIC is a suspected aldol-condensation product.

M: Quantitation Limits are elevated due to matrix interferences.

S: The calibration quality control criteria for this compound were not met. The reported concentration should be considered an estimated quantity.

X1: Contaminant does not appear to be "typical" product. Elution pattern suggests it may be _____.

X2: Contaminant does not appear to be "typical" product. Further testing is suggested for identification.

X3: Identification and quantification of peaks was complicated by matrix interference; GC/MS confirmation is recommended.

X4: RPD for duplicates outside QC limits. Sample was re-analyzed with similar results. Sample matrix is nonhomogeneous.

X4a: RPD for duplicates outside QC limits due to analyte concentration near the method practical quantitation limit/detection limit.

X5: Matrix spike was diluted out during analysis.

X6: Recovery of matrix spike outside QC limits. Sample was re-analyzed with similar results.

X7: Recovery of matrix spike outside QC limits. Matrix interference is indicated by blank spike recovery data.

X7a: RPD value for MS/MSD outside QC limits due to high contaminant levels.

X8: Surrogate was diluted out during analysis.

X9: Surrogate recovery outside QC limits due to matrix composition.

X10: Surrogate recovery outside QC limits due to high contaminant levels.

CHAIN OF CUSTODY

BURLINGTON ENVIRONMENTAL

210 West Sand Bank Road
P.O. Box 330
Columbia, IL 62236-0330
618/281-7173
618/281-5120 FAX

CHAIN-OF-CUSTODY RECORD

C.O.C. SERIAL NO. 6084

PROJECT NAME BEI Pier 91 RFI
PROJECT NUMBER 624875 MAJOR TASK 7302
SAMPLERS J. Peale
LAB DESTINATION SAS

SAMPLE NO.	DATE	TIME	COMP	GRAB	SAMPLE LOCATION	NO. OF CONTAINERS	TYPE OF ANALYSIS: TPH 418.1	TPH 8015	VOC	BNA				ICED	PRESERVATIVES: CHEMICALS ADDED	REMARKS (CHEMICAL ANALYSIS REQUEST FORM NUMBER IF APPLICABLE)
	1/19/93	1020		X	CP-122AC-2-4	2	X	X	X	X				X		
	1/19/93	1215		X	CP-122AC-6-8	2	X	X	X	X				X		only 1-20z. jar rec'd
	1/19/93	1545		X	CP-122AC-22-24	2	X	X	X	X				X		

RELINQUISHED BY

SIGNATURE	DATE	TIME
	1/21/93	1015
	1-21-93	11:50A

RECEIVED BY

SIGNATURE	DATE	TIME
	1-21	10:15A
	1/21/93	11:50AM

SHIPPING NOTES

LAB NOTES